

154 FERC ¶ 61,151
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Cheryl A. LaFleur, Tony Clark,
and Colette D. Honorable.

PJM Interconnection, L.L.C.

Docket No. EL14-94-000

ORDER ON SECTION 206 INVESTIGATION

(Issued March 1, 2016)

1. On August 25, 2014, the Commission established paper hearing procedures pursuant to section 206 of the Federal Power Act (FPA)¹ to investigate whether the provisions of the PJM Interconnection, L.L.C. (PJM) Open Access Transmission Tariff (Tariff) for calculating Projected PJM Market Revenues in the determination of Market Seller Offer Caps are unjust and unreasonable, and unduly discriminatory or preferential.² As discussed below, we find that PJM's tariff is unjust and unreasonable and establish the just and reasonable provisions PJM must implement, to be effective as of the date of this order.

I. Background

2. The PJM Tariff includes the Reliability Pricing Model (RPM) capacity market to ensure resource adequacy for the PJM Region.³ The RPM accomplishes this objective by

¹ 16 U.S.C. § 824e (2012).

² *PJM Interconnection, L.L.C.*, 148 FERC ¶ 61,140 (2014) (August 2014 Order).

³ Capitalized terms not otherwise defined herein have the meaning specified in the Tariff, Amended and Restated Operating Agreement of PJM (Operating Agreement), or the Reliability Assurance Agreement Among Load Serving Entities in the PJM Region (RAA) as appropriate.

obtaining commitments of capacity supply through a PJM-administered Base Residual Auction that occurs three years before the capacity delivery year.

3. Section 6 of Tariff Attachment DD.6 includes the provisions for market power mitigation that apply to the RPM.⁴ The Tariff establishes a market structure screen,⁵ and establishes mitigation measures for generation resources that fail the market structure test.⁶ Mitigation is applied on a unit-specific basis if the Sell Offer of capacity from an Existing Generation Capacity Resource (1) is greater than the Market Seller Offer Cap, and (2) would, absent mitigation, increase the capacity resource clearing price in the relevant auction. If such conditions are met, the Sell Offer is set equal to the Market Seller Offer Cap.

4. Section 6.4(a) of Tariff Attachment DD.6 provides that the Market Seller Offer Cap for an existing generation capacity resource shall be the Avoidable Cost Rate (ACR) less the Projected PJM Market Revenues.⁷ The Tariff specifies a formula for calculating the ACR, and provides for determination of the Projected PJM Market Revenues. In determining Projected PJM Market Revenues, the Tariff provides:

Projected PJM Market Revenues for any generation capacity resource to which the avoidable cost rate is applied shall include all actual unit-specific revenues from PJM energy markets, ancillary services, and unit-specific

⁴ See PJM Interconnection, L.L.C., Intra-PJM Tariffs, OATT ATTACHMENT DD.6. MARKET POWER MITIGATION (8.0.0) (Tariff Attachment DD.6), <http://etariff.ferc.gov/TariffSectionDetails.aspx?tid=1731&sid=145214>.

⁵ The market power screen is referred to as the three pivotal supplier test. Under the test, PJM implements market mitigation measures when there are three or fewer generation suppliers available for redispatch that are jointly pivotal with respect to a transmission limit. If there are three such pivotal suppliers, PJM subjects to mitigation only those generation units whose owner, when combined with the two largest other generation suppliers, is jointly pivotal.

⁶ Tariff Attachment DD.6, Section 6.5. The cost-based offer cap is an estimate of a resource's short-run marginal cost and includes a ten-percent adder or more, depending on whether the resource is determined to be a Frequently Mitigated Resource. PJM Tariff, Att. K-Appendix § 6.4.2.

⁷ ACR is the fixed annual operating costs and incremental investments that allow a generation resource to remain in commercial operation to be available to PJM as a Capacity Resource.

bilateral contracts from such generation capacity resource, net of marginal costs for providing such energy (*i.e., costs allowed under cost-based offers pursuant to Section 6.4 of Schedule 1 of the Operating Agreement*) and ancillary services from such resource.⁸

Projected PJM Market Revenues are calculated taking a rolling simple average of energy and ancillary services market revenues from the three most recent whole calendar years, net of marginal costs for this time period. Section 6.4 of Schedule I generally calculates cost-based offers based on the incremental operating cost of the generation resource, plus 10 percent.⁹

5. Section 6.4(b) of Tariff Attachment DD.6 establishes a process, with specific timelines, in which a potential capacity market seller submits unit-specific data and documentation.¹⁰ Under PJM's Tariff, each Existing Generation Capacity Resource that wishes to submit a non-zero Sell Offer must submit a proposed Market Seller Offer Cap to Monitoring Analytics, Inc., the Independent Market Monitor for PJM (PJM IMM), and PJM prior to the auction.¹¹ PJM reviews the data that the Capacity Market Seller submits, makes a final determination to either accept or reject the requested Market Seller Offer Cap, and notifies the capacity market seller and the PJM IMM of its determination.

II. Procedural History

6. On April 2, 2014, FirstEnergy Solutions Corp. (FirstEnergy) submitted a Petition for Declaratory Order (Petition) with respect to the calculation of Market Seller Offer Caps in the RPM capacity market. FirstEnergy sought a determination from the Commission that PJM's Tariff requires a generator's Market Seller Offer Cap to reflect the unit's cost-based energy offers in the determination of net Projected PJM Market

⁸ *Id.*, Section 6.8(d), emphasis added. See PJM Interconnection, L.L.C., Intra-PJM Tariffs, OA Schedule 1 Sec 6.4 Offer Price Caps., 2.0.0, <http://etariff.ferc.gov/TariffSectionDetails.aspx?tid=1731&sid=140903>. See also PJM Interconnection, L.L.C., Intra-PJM Tariffs, Schedule 2, OA Schedule 2, 2.1.0, <http://etariff.ferc.gov/TariffSectionDetails.aspx?tid=1731&sid=100696>.

⁹ OA Schedule 1 Sec 6.4 Offer Price Caps.(7.0.0), § 6.4.2, <http://etariff.ferc.gov/TariffSectionDetails.aspx?tid=1731&sid=187517>;

¹⁰ *Id.*, Section 6.6 of the Tariff provides offer requirements, and Section 6.7 details data submission requirements.

¹¹ *Id.*, Section 6.4.

Revenues. FirstEnergy contended that the PJM IMM calculates the marginal cost using the lower of the market-based offer and the cost-based offer submitted each hour of each day by the Capacity Market Seller into PJM's markets. FirstEnergy contended that the PJM IMM's methodology contradicts the plain reading of the Tariff, which states that the calculation of marginal cost shall utilize the cost-based offer submitted into PJM's energy markets using the costs allowed under cost-based offers pursuant to Section 6.4 of Schedule 1 of the Operating Agreement.

7. PJM, Duke Energy Corporation, PJM Power Providers Group (P3), and Electric Power Supply Association (EPSA) filed comments supporting the Petition. Organization of PJM States, Inc., Public Utilities Commission of Ohio (Ohio Commission), PJM Consumer Representatives,¹² Office of the Ohio Consumers' Counsel, and PJM IMM submitted protests and comments opposing the Petition. FirstEnergy, PJM IMM and PJM submitted answers.

8. As noted, in the August 2014 Order, the Commission granted the Petition.¹³ Given the concerns raised by the pleadings in the Petition, the Commission found reason to believe that the existing Tariff may be unjust and unreasonable, and unduly discriminatory or preferential. The Commission established paper hearing procedures to determine whether the Tariff provisions for the calculation of Projected PJM Market Revenues in the determination of Market Seller Offer Caps are unjust and unreasonable, and unduly discriminatory or preferential.

9. Finally, we note that under the revised RPM capacity market framework that has adopted capacity performance measures, offers from existing resources may not exceed a default value equal to Net CONE (cost of new entry) times the balancing ratio, unless the offers have a unit-specific cost justification.¹⁴ A unit-specific cost justification is not required for resources that do not offer above the default value since the default value, by design, is the expected offer from a supplier that lacks market power and it has no unit-specific cost elements. One element of the unit-specific cost justification for existing resources offering capacity at a price above the default value is a determination of net

¹² PJM Consumers Representatives are PJM Industrial Customers, West Virginia Consumer Advocate, Maryland People's Counsel, New Jersey Rate Counsel, Delaware Public Advocate, Illinois Citizens Board, and Pennsylvania Consumer Advocate.

¹³ August 2014 Order, 148 FERC ¶ 61,140 at P 29.

¹⁴ *PJM Interconnection, L.L.C.*, 151 FERC ¶ 61,208, at P 336 (2015) (Capacity Performance Order).

energy and ancillary services revenues that requires an estimate of the short-run marginal cost of providing energy.

III. Notice and Responsive Pleadings

10. Notice of the section 206 proceeding was published in the *Federal Register*, 79 Fed. Reg. 52,646 (2014).

11. The Maryland Public Service Commission (Maryland Commission) and the Ohio Commission filed notices of intervention. The PJM Industrial Customers Coalition (PJM Industrial Customers), FirstEnergy, PPL EnergyPlus, LLC, NextEra Energy Resources, LLC, PJM IMM, PJM, PSEG Companies, EPSA, North Carolina Electric Membership Cooperative, NRG Companies, and P3 filed timely motions to intervene. New Jersey Board of Public Utilities (New Jersey Board) filed an out-of-time motion to intervene.

12. As established by the August 2014 Order, Sixty days after publication in the *Federal Register*, PJM was required to submit a brief to show that its Tariff provisions for the calculation of Projected PJM Market Revenues in the determination of Market Seller Offer Caps continues to be just and reasonable. Reply briefs were due 30 days after the date of PJM's submission of its brief.

13. On November 3, 2014, PJM filed its initial brief.¹⁵ On December 3, 2014, the PJM IMM, Ohio Consumers' Counsel, FirstEnergy,¹⁶ P3 and EPSA filed reply briefs. On December 10, 2014, the Maryland Commission and the New Jersey Board (jointly)¹⁷ and the Ohio Commission filed reply briefs. The PJM IMM and FirstEnergy filed responsive answers, and the PJM IMM filed an additional response.

IV. Comments

A. PJM Initial Brief

14. PJM states that to ensure sufficient supply resources in the PJM Region, it offers various opportunities for market participants to cover the costs of being a resource in its capacity and energy markets. PJM states that Capacity Market Sellers' revenues from

¹⁵ As provided by the August 2014 Order, reply briefs were due on December 3, 2014.

¹⁶ FirstEnergy filed an errata on December 4, 2014.

¹⁷ The Maryland Commission and New Jersey Board filed an errata on December 11, 2014.

energy and ancillary services markets alone may not be enough to encourage new supply investment. Accordingly, PJM explains, the RPM capacity market provides an opportunity for market participants to earn enough revenue to cover their fixed and going-forward costs.¹⁸ PJM states that a Capacity Market Seller will offer into the Base Residual Auction only if the combination of net Projected Energy Market Revenues plus RPM revenues exceeds its going forward costs, as demonstrated by its Sell Offer.

15. PJM states that, to guard against the exercise of market power, all Sell Offers from generators are subject to mitigation, whereby a Market Seller Offer Cap is established and reviewed by both PJM and the PJM IMM. PJM notes that the Offer Cap is only invoked if a Generation Capacity Resource is located in a constrained Locational Deliverability Area (LDA) that fails the three pivotal supplier test. To determine a resource's Market Seller Offer Cap, PJM subtracts the net Projected PJM Market Revenues from the unit's ACR.

16. PJM states that the Tariff currently defines marginal cost as costs that are included in cost-based offers. PJM argues that the genesis of the cost-based offer in PJM is Order No. 719, which directed Regional Transmission Organizations to make mitigation provisions as non-discretionary as possible.¹⁹ As a result, PJM explains, it created a Cost Development Guidelines Manual in order to define "standard methodologies that are recognized by PJM as appropriate for determining various cost components for use on those occasions and in those markets where products or services are required to be provided at cost-based rates."²⁰ Therefore, PJM argues, using a value other than the cost-based offer to determine net Projected PJM Market Revenues would place PJM and the PJM IMM in the position of deciding what costs are more reflective of marginal costs than the cost-based offer. PJM states that market-based offers are a poor proxy for determining marginal cost because these can be higher or lower than cost-based offers due to operational characteristics, such as start-up times and no-load costs, among others. Accordingly, PJM concludes that energy market offers may not reflect short-run marginal costs as well as cost-based offers.

¹⁸ PJM Initial Brief at 3-4 (citing *PJM Interconnection, L.L.C.*, 117 FERC ¶ 61,331 (2006) (RPM Settlement Order), *order on reh'g*, 119 FERC ¶ 61,318 (2007)).

¹⁹ PJM Initial Brief at 7 (citing *Wholesale Competition in Regions with Organized Electric Markets*, Order No. 719, FERC Stats. & Regs. ¶ 31,281, at P 379 (2008) (Order No. 719)).

²⁰ *Id.* at 8.

B. Reply Briefs**1. FirstEnergy**

17. In its Reply Brief, FirstEnergy alleges that PJM has recognized a threat to system reliability posed by large-scale retirements of baseload generation and inadequate capital investment in critical resources, and argues that appropriate offer caps accurately reflect revenues that generators need from the capacity markets.²¹ FirstEnergy states that the relevant question is not whether any alternative Tariff provisions would be more just and reasonable than the existing Tariff, but rather whether the use of cost-based bids to calculate net Projected PJM Market Revenues remains just and reasonable.

18. FirstEnergy and its expert witness, Dr. Shaun Ledgerwood, argue that cost-based offers are an accurate and transparent method for estimating marginal cost, as developed through PJM's Cost Development Subcommittee, and articulated in PJM Manual 15. FirstEnergy states that the PJM IMM is involved in verifying that cost-based offers are properly developed, and that their use in calculating Market Seller Offer Caps was well-understood and uncontroversial for many years.²²

19. According to FirstEnergy, market-based offers are different, and reflect factors other than marginal cost. FirstEnergy states that nuclear and coal units need to run continuously to reach maximum efficiency and prevent expensive tube leaks or other associated repairs which in turn could cause forced outages. FirstEnergy maintains that some units need to keep producing power to avoid incurring take-or-pay fuel contracts. FirstEnergy states that combined cycle units often need to keep running to avoid factored starts, which are an important factor for expensive hot gas path inspections and overhauls.²³ FirstEnergy avers that these costs may be factored into a market-based offer causing it to be higher than a cost-based offer, reflecting cycling costs, or lower than a cost-based offer, in order to avoid the cycling costs, depending on owner preferences.²⁴

20. As outlined further by Dr. Ledgerwood, lowering a market-based offer to ensure a baseload plant runs all day may create cost savings greater than any losses incurred by

²¹ FirstEnergy Solutions Corp. (December 3, 2014) Comments at 1.

²² *Id.*

²³ *Id.* at 9.

²⁴ *Id.* at 10.

having to run when actual marginal costs are greater than the market-clearing price.²⁵ Therefore, FirstEnergy alleges, using the PJM IMM's lower-of methodology could result in an Energy and Ancillary Services offset calculation that assumes energy market profits that did not actually occur. According to FirstEnergy, were the lower-of methodology to be adopted, in the short-run, resources may choose to bid into the energy market using a cost-based offer, while, in the long-run, plants may be forced to retire prematurely.²⁶

21. FirstEnergy also alleges that the lower-of methodology is logically inconsistent. According to FirstEnergy, the PJM IMM argues that competitive market forces drive a generator to offer into the market below a cost-based offer and that this offer is a true reflection of a unit's marginal cost. However, FirstEnergy asserts, the PJM IMM fails to explain why this is the case, while a higher market-based offer should be disregarded.²⁷

22. Finally, FirstEnergy argues that the cost-based offer should be used to determine net Projected PJM Market Revenues because it is objective, non-discretionary and easily administered. FirstEnergy argues that FERC Order No. 719 requires PJM's Tariff to be as easily administered and as non-discretionary as possible, and that the use of cost-based offers meets this criterion.²⁸ Even the use of a fuel and emissions costs exception, according to FirstEnergy, would inevitably require an amount of discretionary judgment or an arbitrary "bright-line" test that fails to recognize the individual nature of each unit.²⁹

2. PJM IMM

23. In its Reply Brief, the PJM IMM argues that PJM's Tariff is not just and reasonable and should be modified to permit the use of the best available information on marginal costs in defining net revenues.³⁰ The PJM IMM states that non-zero, market-

²⁵ *Id.* at 11.

²⁶ *Id.* at 12-13.

²⁷ *Id.* at 13.

²⁸ *Id.* at 14 (citing Order No. 719, FERC Stats. & Regs. ¶ 31,281 at P 379, *order on reh'g*, Order No. 719-A, FERC Stats. & Regs. ¶ 31,292, *reh'g denied*, Order No. 719-B, 129 FERC ¶ 61,252 (2009)).

²⁹ *Id.* at 14-15.

³⁰ Reply Brief of the Independent Market Monitor for PJM, December 3, 2014 at 2.

based offers reveal a unit's actual marginal costs when lower than cost-based offers under competitive conditions, and therefore, they should be used in the net Projected PJM Market Revenues calculation rather than the higher, cost-based offers. Specifically, the PJM IMM argues that the best way to determine marginal costs is to use the lower of a unit's cost-based offer or market-based offer, if the market-based offer exceeds marginal costs based on fuel and emission costs, while providing the seller the opportunity to support the assertion that its lower market-based offer is less than its marginal costs.³¹ The PJM IMM states that its recommended approach to calculating offer caps in the capacity market is consistent with the way in which offer caps are calculated in the energy market. A unit with structural market power in PJM's energy market will have its offer mitigated to the lower of its cost-based or market based offer.³² The PJM IMM proposes Tariff language to reflect this method.³³

24. The PJM IMM states that structural market power is endemic in the RPM market and effective market power mitigation is necessary to ensure competitive results.³⁴ The PJM IMM notes that when market power mitigation applies, Capacity Market Sellers are limited to Sell Offers at or below their Market Seller Offer Caps. The PJM IMM explains that the Market Seller Offer Cap for an existing resource equals its ACR, plus a 10 percent adder, less net Projected PJM Market Revenues. The PJM IMM states that the 10 percent adder is meant to account for the uncertainty of the way ambient conditions affect combustion turbines' operating costs.³⁵

25. The PJM IMM argues that the idea that cost-based offers always reflect marginal costs is not consistent with the observed behavior of generation owners, noting that a significant number of units in PJM submit market-based offers below their cost-based offers. The PJM IMM asserts that when a market participant submits a non-zero, market-based energy offer below the cost-based offer, it is strong evidence that the unit's market-based offer equals its actual marginal costs.³⁶

³¹ *Id.*

³² *Id.* at 6-7.

³³ *Id.* at 12-13. *See also*, PJM IMM January 12, 2015 Answer at 9, proposing different Tariff language for the Commission's consideration.

³⁴ *Id.* at 3.

³⁵ *Id.* at 6.

³⁶ *Id.*

26. The PJM IMM states there are several examples of how PJM's current Tariff will lead to the exercise of market power. First, the PJM IMM argues that units that can use multiple fuels base their higher, cost-based offers on their secondary fuel (oil), and their lower market-based offers on the primary fuel (natural gas).³⁷ The PJM IMM states that PJM's current Tariff would require the use of the higher, cost-based offer in the calculation of net Projected PJM Market Revenues despite the fact that the unit actually burns the lower-cost natural gas. The PJM IMM's proposed approach would use the lower, market-based offer, consistent with the actual fuel burned and the actual marginal fuel costs.³⁸ Second, the PJM IMM argues that the adder for Frequently Mitigated Units (FMU) was meant to address revenue shortfall and it would be inappropriate to include such an adder as part of a cost-based offer.³⁹

27. Finally, the PJM IMM also argues that marginal cost can be reliably determined based on unit offers and without reliance on the PJM IMM's discretion.⁴⁰ The PJM IMM asserts that it does not propose to exercise discretion, and it did not do so in the seven years during which it used market-based offers as a basis for determining Market Seller Offer Caps. The PJM IMM notes that the market participant always has the final decision about what offer to enter in the PJM market. The PJM IMM proposes to continue to apply the current process for review of offers and to continue to reserve the currently defined roles for the PJM IMM, PJM and the Commission.⁴¹

28. The PJM IMM proposes a revised tariff provision which states that marginal cost shall be calculated as equal to the lower of (i) market-based offers for the sale of energy or ancillary services from such resource or (ii) cost-based offers. The PJM IMM also includes a provision stating that marginal costs for a unit shall be calculated as the cost-based offer when the Capacity Market Seller can demonstrate that the market-based offer is less than the marginal cost of fuel and emissions allowances for the unit.⁴²

³⁷ *Id.* at 7.

³⁸ *Id.*

³⁹ *Id.* at 8

⁴⁰ *Id.* at 10.

⁴¹ *Id.*

⁴² *Id.* at 12-13.

3. P3/EP SA Joint Reply Brief

29. P3 and EPSA submitted a joint reply brief in support of PJM's Initial Brief, arguing that the PJM Tariff currently provides for a just and reasonable method of calculating Market Seller Offer Caps. P3 and EPSA assert that resources need the ability to submit market-based offers below their marginal costs due to operational and other non-cost factors. They aver that the PJM IMM's preference for using the lower of non-zero market-based or cost-based offers would financially penalize a Capacity Market Seller for submitting market-based offers below its marginal costs. They argue that the current methodology, as prescribed in the PJM Tariff, is objective and widely accepted by PJM market participants. Additionally, they state that the methodology is non-discretionary, consistent with Order No. 719, and makes future litigation less likely to occur.⁴³

4. Ohio Consumers' Counsel

30. Ohio Consumers' Counsel argues that actual energy offers in competitive markets reflect the true short-run marginal cost of the resource – a long-standing economic principle. Specifically, they point to the affidavit of Dr. Frank A. Wolak in a previous PJM proceeding, arguing that suppliers that believe they are unable to influence the market price unilaterally will bid their marginal costs to maximize their profits.⁴⁴ Dr. Wolak argued that because the PJM Tariff guarantees cost recovery for dispatched units' start-up and no-load costs there is no incentive for a supplier facing competition to bid more than its marginal cost.

31. Ohio Consumers' Counsel agrees with the principles laid out in the Wolak Affidavit, arguing that a recent Commission Staff report found that mitigation procedures in RTO/ISO markets are "based on the premise that in a competitive wholesale electricity market, a resource's offer will be approximately equal to its short-run marginal cost (including opportunity costs)."⁴⁵ They argue that the Staff Analysis found that in the

⁴³ P3/EP SA Reply Brief at 4.

⁴⁴ Ohio Consumers' Counsel at 5-6 (citing Maryland Public Service Commission v. PJM Interconnection, L.L.C., and PJM Interconnection, L.L.C., Docket Nos. EL08-34-000 and EL08-47-000, Aff. of Frank A. Wolak, Ph.D., on behalf of Concerned Customers (Oct. 6, 2008)) (Wolak Affidavit).

⁴⁵ *Id.* at 7 (citing Price Formation in Organized Wholesale Elec. Mkts, Docket No. AD14-14-000, Staff Analysis of Energy Offer Mitigation in RTO and ISO Markets (Oct. 2014)) (Staff Analysis).

markets it examined, energy offers were concentrated at levels very close to marginal cost, and that such an observation is consistent with either market forces imposing competitive pressure, or resources offering at marginal cost to avoid mitigation.

32. Additionally, Ohio Consumers' Counsel maintains that in the past, PJM made the exact opposite arguments as in its Initial Brief: "[E]conomic theory shows the optimal strategy for suppliers in a perfectly competitive market is to offer supply to the market at their respective marginal costs, and consequently that perfectly competitive markets should result in prices equal to the marginal cost of delivering one more unit to the market."⁴⁶ Ohio Consumers' Counsel argues that the PJM IMM has recognized PJM energy markets to be competitive and that marginal resources generally offer at marginal cost.

33. Ohio Consumers' Counsel argues that Commission precedent⁴⁷ recognizes that actual energy offers in competitive markets provide the best evidence of short-run marginal costs, and that this precedent has been upheld by several courts of appeal.⁴⁸ They allege that PJM's Initial Brief provides neither economic nor legal precedent supporting the position that cost-based offers provide better evidence of short-run marginal costs in competitive markets than do market-based offers. Ohio Consumers' Counsel contends that although PJM's Cost Development Guidelines provide for the submission of cost-based offers, that does not mean that their use meaningfully captures incremental costs. At best, they allege, cost-based offers are a substitute during constrained periods for the direct observation of marginal costs that would otherwise be reflected in competitive markets.

34. Finally, Ohio Consumers' Counsel states that the failure to use the lower-of approach would allow for the exercise of market power and higher capacity prices. They point to the PJM IMM's 2013 State of the Market Report, which found that 93 percent of the marginal resources in the real-time market, and 99 percent of resources in the day-

⁴⁶ *Id.* at 8 (citing PJM Interconnection, L.L.C., Docket Nos. EL08-34-000 and EL08-47-000, Report of PJM Interconnection, L.L.C., Docket Nos. EL08-34 and EL08-47 at 15 (Sept. 5, 2008)) (citing *Economics of Regulation and Antitrust*, Third Edition by W. Kip Vicusi, John M. Vernon and Joseph E. Harrington, Jr. at 75-78, and *Intermediate Microeconomics: A Modern Approach*, Third Edition by Hal. R. Varian at 363-366, 379-381 (1987)).

⁴⁷ *Id.* at 9 (citing *AEP Power Marketing, Inc.*, 107 FERC ¶ 61,018 (2004)).

⁴⁸ *Id.* at 9 (citing, *e.g.*, *Tejas Power Corp. v. FERC*, 908 F.2d 998 (D.C. Cir. 1990)).

ahead market, that year had average dollar markups of less than zero.⁴⁹ According to Ohio Consumers' Counsel, that means that those identified resources offered to supply the market for less than their cost-based offers would otherwise allow. Ohio Consumers' Counsel states that this evidence supports the Staff Analysis that during most hours, energy offers in RTO markets, including PJM, reflect short-run marginal costs. They argue that using the cost-based offer does not protect consumers from administratively determined offers that may include amounts above short-run marginal costs, such as the 10 percent adder, resulting in unjustly inflated capacity prices.

C. Answers

1. Ohio Commission

35. The Ohio Commission agrees with the PJM IMM that PJM's Tariff is unjust and unreasonable. The Ohio Commission states that the Commission should consider the potential for adverse market impacts if there is no change to the PJM Tariff. The Ohio Commission notes that the PJM IMM is charged with bringing market power concerns to the Commission's attention, and avers that the PJM IMM has raised credible arguments indicating that the exercise of market power may occur absent a tariff revision.⁵⁰ The Ohio Commission maintains that PJM has not adequately addressed the issues raised by the PJM IMM in its initial comments, and alleges that the harm from overstated Market Seller Offer Caps is significant.

2. Maryland Commission and New Jersey Board

36. The Maryland Commission and the New Jersey Board state that they adopt the position of the PJM IMM, and agree that sole reliance on cost-based offers to determine the net Projected PJM Market Revenues will result in overstated Market Seller Offer Caps and the exercise of market power. They assert that the PJM IMM's proposal allows generators to make a showing that their market-based offers do not accurately reflect their marginal costs. They claim that allowing the PJM IMM and PJM to examine cost-based offers that exceed a generator's marginal cost does not import improper discretion; rather, they argue, a rigid cost-based offer standard will lead to inequity and unfairness to end users.

⁴⁹ *Id.* at 12 (citing the PJM 2013 State of the Market Report at 59-60, available at: http://www.monitoringanalytics.com/reports/pjm_state_of_the_market/2013/2013-som-pjm-volume2-sec3.pdf).

⁵⁰ Ohio Commission Reply Brief at 3 (citing PJM Tariff, Att. M, § IV).

37. In addition, the Maryland Commission and the New Jersey Board do not agree that the 10 percent adder is a proper element of marginal cost recovery through energy market prices. Rather, they agree with the PJM IMM that such adders are not includable as marginal cost, as market sellers are willing at times of intense competition to eschew such adders to ensure that their offers clear in PJM's markets.

38. The Maryland Commission and the New Jersey Board argue that under the Commission's interpretation, the 10 percent non-cost adder is recovered twice in Market Seller Offer Cap pricing. They explain that the 10 percent adder is permitted to be recovered as an element of the ACR as defined in the Tariff and is also allowed as a subtraction to the net Projected PJM Market Revenues offset, essentially allowing the adder to be recovered twice under the PJM Tariff. Finally, in response to FirstEnergy and P3/ESPA, the Maryland Commission and the New Jersey Board state that they do not agree that PJM Manual 15's rules for cost-based offer determination are transparent or fair to end users.⁵¹

3. FirstEnergy

39. Responding to the Ohio Commission, and the Maryland Commission and the New Jersey Board which argue that net Projected PJM Market Revenues should be calculated based on the lower-of methodology, FirstEnergy states that exceptions can be made for cases in which fuel and emission costs are documented to be higher than a market-based offer, and that certain flaws in the rules applicable to cost-based offers exist.⁵²

40. FirstEnergy counters that: (a) the energy market mitigation process should not dictate the determination of the marginal cost for the RPM Offer Caps, (b) the opposing parties' alternative proposals are unjust and unreasonable, and (c) the rules applicable to dual-fuel units, Frequently Mitigated Units, and the 10 percent adder do not justify the use of a lower-of methodology.

41. First, FirstEnergy contends that just because energy market mitigation procedures use the lower of market-based and cost-based offers, it does not logically follow that capacity markets must use the same methodology. FirstEnergy asserts that energy-market mitigation procedures exist to prevent pivotal resources from raising market-based offers above competitive levels and setting the market clearing price,⁵³ whereas the

⁵¹ Maryland Commission and New Jersey Board Reply Brief at 5.

⁵² FirstEnergy Solutions Corp. (December 18, 2014) Comments at 1-2.

⁵³ *Id.* at 2-3.

net Projected PJM Market Revenues calculation is intended to be an after-the-fact approximation for profits actually earned from energy and ancillary service markets.⁵⁴ More specifically, FirstEnergy argues, when a unit submits a market-based offer below the cost-based offer, it is expressing willingness to incur short-run losses with the intention of avoiding other costs. However, this is not a signal that its lower, market-based offer is equal to the unit's incremental cost of production, according to FirstEnergy.⁵⁵ FirstEnergy further states that the purpose of mitigation in the energy market is to protect against the submission of artificially high market-based offers and that, by contrast, the energy and ancillary services offset calculation is intended to approximate how much net energy and ancillary service revenue was earned. According to FirstEnergy, it therefore does not logically follow that capacity market mitigation procedures should use the lower-of methodology simply because it is consistent with energy market procedures.⁵⁶

42. Second, FirstEnergy states that opposing parties' proposals are unjust and unreasonable. FirstEnergy notes that the PJM IMM and Ohio Consumers' Counsel cite basic economic principles to argue that market-based offers below cost-based offers provide the best evidence of short-run marginal cost, in most circumstances. FirstEnergy argues that they do not explain why market forces do not discipline market-based offers that are above cost-based offers. If market forces compel market participants to make market-based offers at marginal cost, FirstEnergy states, then the Market Seller Offer Cap should be based on market-based offers in all circumstances, which no one advocates.⁵⁷

43. According to FirstEnergy, the lower-of methodology would also establish an unreasonable new default standard for marginal cost. FirstEnergy states that the PJM IMM's proposal to create an exception when the market-based offer is below fuel and emissions costs draws an arbitrary bright line that would, in effect, set the threshold for marginal cost at fuel plus emissions costs. FirstEnergy argues that this bright line would fail to recognize legitimately incurred variable operations and maintenance costs and opportunity costs for the purpose of calculating net Projected PJM Market Revenues.⁵⁸

⁵⁴ *Id.* at 4.

⁵⁵ *Id.* at 3.

⁵⁶ *Id.* at 4.

⁵⁷ *Id.* at 4-5

⁵⁸ *Id.* at 6-7.

44. FirstEnergy also contends that the PJM IMM's proposal would discourage offer behavior that is in the sellers' and PJM consumers' best interests. FirstEnergy states that the PJM IMM's proposal would penalize a resource by denying cost recovery for any hour in which market prices clear below a resource's cost-based offer, when a resource clears based on a market-based offer that is below its incremental costs.⁵⁹ FirstEnergy rebuts the PJM IMM's contention that units could self-schedule, which FirstEnergy interprets to mean "block loading" the unit.⁶⁰ FirstEnergy asserts that this strategy removes dispatch options from PJM schedulers and may not be beneficial for units that have the ability to ramp and respond to changing price signals.⁶¹

45. Third, FirstEnergy contends that the rules applicable to dual-fuel units, Frequently Mitigated Units, and the 10 percent adder do not justify use of a lower-of methodology. FirstEnergy states that these are a discreet number of situations that involve a small number of units that would be better remedied by clarifying other Tariff language. FirstEnergy concludes that there is no perfect way to estimate a unit's incremental cost of producing energy and that, cost-based offers were developed for this precise reason and thus should be used to estimate the unit's Energy and Ancillary Services offset.⁶²

4. PJM IMM

46. In its December 18, 2014 Answer the PJM IMM states FirstEnergy's argument is that "generators have legitimate business reasons to submit price-based offers that are below their cost-based offers."⁶³ Further, the PJM IMM states that FirstEnergy nowhere asserts that the hypothetical advanced by its witness, whereby a unit offers to provide energy below its marginal cost to avoid cycling of the unit, actually describe its actions which resulted in the proceeding. The PJM IMM maintains that FirstEnergy's defense of PJM Tariff depends entirely on how application of that rule would avoid the hypothetical

⁵⁹ *Id.* at 8.

⁶⁰ FirstEnergy defines "block loading" as setting the economic minimum operating level for the unit equal to the economic maximum. *Id.*

⁶¹ *Id.*

⁶² *Id.* at 12.

⁶³ PJM IMM Answer at 2.

results explained by its witness, and did not attempt to defend against all of the Tariff section's other unjust and unreasonable outcomes that will result from its application.⁶⁴

47. The PJM IMM explains that there are several logical possibilities relevant to choosing between cost-based offers and market-based offers in the calculation of net Projected PJM Market Revenues, and that FirstEnergy focused only on the first one, namely, that a unit's actual short run marginal costs are equal to its cost-based offer and greater than its market-based offer. While the PJM IMM agrees that FirstEnergy identifies a "logical possibility," it maintains FirstEnergy ignores other possibilities, which the PJM IMM alleges can and do occur.⁶⁵ The PJM IMM maintains that in its experience, working with market participants since 1999 to calculate Market Seller Offer Caps, the following scenarios have occurred: (i) a unit's actual short run marginal costs are less than its cost-based offer and equal to its market-based offer; and (ii) a unit's actual short run marginal costs are less than its cost-based offer and less than its market-based offer. The PJM IMM reiterates that its proposed Tariff language is a just and reasonable replacement to the existing Tariff as it accounts for all possible scenarios, and would enable the Market Seller to justify costs under scenarios described by FirstEnergy where a resource makes a market-based offer below its marginal cost.

48. In its January 12, 2015 Answer, the PJM IMM argues that FirstEnergy implicitly concedes that use of the cost-based offer to calculate marginal costs will over-compensate Market Sellers.⁶⁶ The PJM IMM states that FirstEnergy does not demonstrate that there is anything arbitrary about the PJM IMM's proposed Tariff language. The PJM IMM maintains that if a unit's offer excludes certain variable operating and maintenance expense costs, that offer reveals the unit's view of its actual marginal costs. Similarly, the PJM IMM argues that opportunity costs are legitimate marginal costs, if they exist. However, the PJM IMM notes that if a unit does not include such costs in its offer, it is making clear that it does not believe that they are marginal costs for that unit for that day. Accordingly, the PJM IMM proposes a screen to ensure that a market-based offer is not clearly below "what are unambiguously marginal costs, fuel costs plus emissions costs."⁶⁷ The PJM IMM continues that any offer equal to or greater than that level is consistent with a market participant's view of its actual marginal costs, which frequently exclude other marginal costs, such as variable operating and maintenance expenses.

⁶⁴ *Id.* at 2 – 3 (citing Tariff Attachment DD.6, Section 6.8(d)).

⁶⁵ *Id.* at 3.

⁶⁶ PJM IMM January 12, 2015 Answer at 2.

⁶⁷ *Id.* at 4.

V. Discussion

A. Procedural Matters

49. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2015), the notices of intervention and timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. Given its interest in the proceeding, the early stage of this proceeding and the absence of undue prejudice or delay, we grant the unopposed out-of-time motion to intervene that the New Jersey Board submitted.

50. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2015), prohibits an answer to a protest or to an answer unless otherwise ordered by the decisional authority. We will accept the answers filed in this proceeding because they have provided information that assisted us in our decision-making process.

B. Determination

51. As discussed below, we find that PJM's Tariff is unjust and unreasonable because it allows the cost-based energy offer cap to be used as the *sole* measure of short-run marginal cost in calculating capacity market offer caps.⁶⁸ In the PJM energy markets, when a Market Seller fails PJM's three pivotal supplier test, its energy offer may not exceed a predetermined cost-based offer.⁶⁹ When a resource is subject to market power mitigation but submits a non-zero offer less than its cost-based offer, PJM uses the lower, market-based offer, not the cost-based cap, as the basis for the resource's commitment and dispatch.⁷⁰

52. Market power mitigation in the RPM capacity market entails limiting the capacity offers of all existing capacity resources to either the default or unit-specific value to prevent economic withholding that could otherwise result in market clearing capacity prices exceeding a competitive level. Higher levels of short-run marginal cost translate into lower levels of net energy and ancillary services revenues and allow a capacity seller to justify a higher Market Seller Offer Cap for capacity.

⁶⁸ PJM Tariff, Attachment DD, Section 6.8(d).

⁶⁹ PJM Tariff, Attachment K-Appendix § 6.4.1.

⁷⁰ *Id.*, Sections 1.10.8(a), 6.4.1.

53. Under conditions where sellers lack market power and a uniform market clearing price is paid to all suppliers, a competitive seller of energy maximizes its profits by offering energy at its short-run marginal cost. Thus, an accepted non-zero energy offer that is less than the cost-based offer indicates that the seller's short-run marginal cost is less than the predetermined cost-based offer cap. We agree with the PJM IMM that in most circumstances an accepted non-zero energy offer that is less than a resource's cost-based offer is an appropriate measure of short-run marginal cost and, when available, should be used in the calculation of a Market Seller Offer Cap for capacity.

54. PJM and FirstEnergy argue that non-zero market-based offers may be lower than marginal cost, and therefore the cost-based offer should be used as the marginal cost for purposes of calculating Market Seller Offer Caps. PJM⁷¹ and FirstEnergy⁷² posit situations in which the short-run marginal cost of a generator is reduced in a particular hour to accommodate operational characteristics of certain generators requiring long run times, and argue that such factors should not result in a reduction of costs for the purpose of projecting future costs to determine the unit specific offer cap. Although the PJM IMM recognizes that these hypotheticals are a logical possibility, it states that this situation does not represent the norm. The PJM IMM also states that, to the extent these circumstances do occur, they can be addressed by finding that in the case in which a market offer is below the unit's variable cost of fuel and environmental costs, the fuel and environmental costs would be used.

55. We find that the potential situations posited by PJM and FirstEnergy do not justify the continued use of the cost-based offer in all circumstances in which the market offer is less than the cost-based offer. However, as noted by the PJM IMM, when the market-based offer falls below the variable costs of fuel and environmental costs, a cost-based offer legitimately can be used, since the generator is losing money for each MW produced, so a reasonable projection of its energy and ancillary services revenue should reflect such a reduction.

56. Moreover, we find that PJM's existing tariff is unjust and unreasonable insofar as it uses the cost-based offer whenever the market-based offer exceeds the cost-based offer even in the circumstance in which the resource's offer is not mitigated. As long as the resource is not exercising market power, market-based offers above the cost-based offer also represent marginal cost, based on the same economic principles noted above.

⁷¹ PJM Initial Brief at 8-9.

⁷² FirstEnergy Reply Brief at 5.

57. We also disagree with PJM and FirstEnergy that using a value other than the cost-based offer as representing short-run marginal costs would contravene Order No. 719, and give the PJM IMM undue discretion over mitigation provisions.⁷³ Order No. 719 does not address the best methodology to determine Market Seller Offer Caps. Moreover, it is not clear why the PJM IMM would have undue discretion since it would be using an objective value, market-based offers, to reflect marginal costs. In any event, under Order No. 719, PJM is required to review all market monitor determinations, so the PJM IMM will not have unlimited discretion. Other RTOs that have complied with Order No. 719 also rely on market-based offers, rather than cost-based offers. For example, the New York Independent System Operator, Inc. (NYISO) accepts three ways of calculating marginal cost, in the following order of preference: (i) the mean or median of the resource's accepted offers during competitive periods in the previous 90 days, adjusted for fuel prices; (ii) the mean of the Locational Marginal Price (LMP) at the resource's location, during the lowest-price 50 percent of hours when the resource was dispatched in the previous 90 days; or (iii) determined in consultation with the resource, based on the resource's documented marginal costs (*e.g.*, heat rate * fuel costs).⁷⁴

58. We therefore conclude that PJM's current tariff using cost-based offers in all circumstances to reflect marginal cost is at odds with the rest of PJM's market design and is unjust and unreasonable. As noted above, in the energy market, when a generation resource fails the three pivotal supplier test and submits a non-zero market-based offer less than its cost-based offer cap, PJM uses the lower, market-based offer, not the cost-based offer, as the basis for determining the resource's commitment and dispatch. When a resource is not subject to market power mitigation, PJM uses its offer as the basis for the resource's commitment and dispatch. In both cases, PJM's energy market relies on the offer, not the cap, as reflecting the resource's short-run marginal cost.⁷⁵

59. Under section 206 of the FPA, having found PJM's Tariff unjust and unreasonable, the Commission is required to establish the just and reasonable replacement rate. We find that PJM should apply the following procedure in determining marginal cost estimates. As discussed above, when the resource is not exercising market

⁷³ *E.g.*, PJM Initial Brief at 7 (citing Order No. 719, 73 Fed. Reg. 64,100, FERC Stats. & Regs. ¶ 31,281 at P 379).

⁷⁴ *See, e.g.*, NYISO Market Administration and Control Area Services Tariff, Attachment H §§ 23.3.1.4.1.1 – 23.3.1.4.1.3.

⁷⁵ The cost-based rate is an administratively determined marginal cost for the purpose of mitigation. In a well-functioning market, a market-based offer by a company without market power should represent the company's determination of its marginal cost.

power, reliance on the market-based offer, not the cost-based cap, is an accurate measure of the resource's short-run marginal cost in calculating its Market Seller Offer Cap. Thus, PJM should use the resource's non-zero market-based offer to reflect marginal costs except in two circumstances, in which the cost-based offer should be used: 1) when the resource is mitigated and its market-based offer is above the cost-based offer cap under PJM's Tariff, as the market-based offer in this circumstance may reflect the exercise of market power; and 2) when the market-based offer is less than its fuel and environmental costs, since the generator is losing money for each MW produced, a reasonable projection of its energy and ancillary services revenue should reflect such a reduction.

60. This requirement will become effective as of the date of this order. PJM is directed to file Tariff language within 30 days of this order to include these principles, as well as the specific methodologies for calculating the marginal cost estimates.

The Commission orders:

(A) PJM's existing Tariff with respect to calculating market-based offer caps is found unjust and unreasonable and PJM must implement, to be effective as of the date of this order, the procedures discussed in the body of the order.

(B) PJM is hereby directed to submit a compliance filing within 30 days of this order, as discussed in the body of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.